

SOV/4809

High-Voltage Testing (Cont.)

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APPROVED

88088

9,2400 (1001, 1150, 1331)

S/110/60/000/007/001/005
EO73/E535

AUTHORS: Vorob'yev, A.A., Doctor of Physico-Mathematical Sciences,
Vorob'yev, G.A., Candidate of Technical Sciences,
Dmitrevskiy, V.S., Candidate of Technical Sciences and
Kalyatskiy, I.I., Candidate of Technical Sciences

TITLE: New High-Voltage Laboratory in Siberia.

PERIODICAL: Vestnik elektropromyshlennosti, 1960, No.7, pp.18-21

TEXT: In 1960 a comprehensive high-voltage laboratory was
built at the Tomskiy politekhnicheskii institut (Tomsk Polytechnical
Institute). Breakdown phenomena of gaseous and liquid insulation,
the breakdown and destruction of solid dielectrics and the insula-
tion systems of high-voltage power equipment will be studied in
this laboratory; it will also be available for experiments by
students specializing in high-voltage engineering. The laboratory
has a high-voltage hall of 460 m² floor space, an open testing area
of 4000 m², and auxiliary buildings. The main equipment consists
of a 5000 kV outdoor and a 3000 kV indoor surge generators and a
series of test transformers rated at 50 c.p.s., 1000 kV and
1000 kVA. The space occupied by this equipment was the main

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factor determining the dimensions of the high-voltage laboratory. The high-voltage hall is 21 x 22 m with a height of 16 m. It has natural illumination from the southern and western sides, a ventilation system that ensures complete replacement of the air five times an hour, water-operated heating and electric lighting. For handling the equipment a 5 ton gantry crane with a span of 20 m is available. The 3000 kV surge generator is 9 m high with cross-section dimensions of 2.5 x 4 m. The step up-rectifier system for charging the surge generators is based on a doubling circuit with a maximum voltage of 300 kV and a power consumption of 20 kVA during maximal conditions. A photograph is included of the 3000 kV surge generator with a sphere-sphere gap. The total weight of the generator is about 12 tons. It has equipment for automatic striking of the first discharge gap, automatic grounding on disconnecting the generator, equipment for changing the polarity of the pulse and remote control of the movement of the rod with the intermediate discharge gaps and of the bottom, 1 mm dia., metering sphere. A 12-stage, 1200 kV surge generator is also erected in

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this hall and is built in six storeys, each containing condensers in metallic housings, 0.28 μ F, 100 kV operating voltage; when using a surge capacitance of 23 000 pF, the energy reserve is 16.5 kW-secs. There is also a third surge generator, of 600 kV, made up of two stages and having an energy reserve of 17.3 kW-secs when the capacitance during the surge is 96 000 pF. The screening, which is described, proved sufficient during operation of the surge generator to exclude any electromagnetic influence on the metering and radio circuits in the halls neighbouring the high-voltage hall. Test transformers are used as the high-voltage a.c. source, and are installed in two zones of the high-voltage hall. For inter-phase tests, a 250 kV, 150 kVA transformer is used. Phase insulation is tested by means of a 200 kV, 35 kVA transformer. The transformers have a stepless voltage regulation and the necessary protective equipment. For measuring the high-voltage, 50 cm dia. sphere-sphere discharge gaps and 300 kV voltmeters are provided. Liquid insulation is tested in a tank of 3 m dia. and 16 m³ volume which has a removeable lid and a bushing designed for 110 kV. X

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Control of each of the high-voltage apparatus and the metering equipment is independent and is concentrated on a platform 3 m wide located at the third storey fitted with control panels for the 200 kV and 250 kV transformers and for the 600, 1200 and 3000 kV surge generators. The dimensions of the hall were governed by the size of the 3000 kV surge generator. The outdoor test space, 80 x 50 m, is provided for investigating insulation under the conditions of the Siberian climate. The high-voltage equipment of this test area consists of three 1000 kV, 1000 kVA transformers and a 5000 kV surge generator. The control of the high-voltage outdoor apparatus is from a single-storey building with a floor space of 170 m². A photograph is included of the outdoor test area which also shows a general view of the high-voltage laboratory building. The training and auxiliary buildings consist of a high-voltage laboratory with equipment for obtaining a.c., d.c. and surge voltages up to 300 kV, an over-voltage laboratory, an oscillographic laboratory and an insulation engineering laboratory, with an air-conditioned chamber in which any temperature between -70 and 100°C

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can be maintained while a high voltage of 30 kV is applied.
There are 4 figures.

X

Card 5/5

VOROB'YEV, A.A., doktor fiziko-matematicheskikh nauk, prof.;
BORISOV, R.I., kand.tekhn.nauk, dotsent; TOLPYGO, O.B.,
kand.tekhn.nauk, dotsent; KALYATSKIY, I.I.

"High-voltage engineering," Part 3, No.1: "Wave processes
and internal overvoltages in electrical systems" by L.I.
Sirotinskii. Reviewed by A.A. Vorob'ev and others.
Elektrichestvo no.5:89-90 My '61. (MIRA 14:9)
(Electric power distribution—High tension)
(Sirotinskii, L.I.)

KALYATSKIY, I.I.; KASSIROV, G.M.

Breakdown of a high vacuum by short voltage pulses. Izv. vys.
ucheb. zav.; fiz. no.4:78-81 '63. (MIRA 16:9)

1. Tomskiy politekhnicheskii institut imeni S.M.Kirova.
(Breakdown, Electric)

KALYATSKIY, I.I., kand.tekhn.nauk; SINEBYUKHOV, A.G., inzh.

Power characteristics of an impulse spark in solid dielectrics.
Izv. vys. ucheb. zav.; energ. 6 no.3:96-98 Mr '63. (MIRA 16:5)

1. Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskii
institut imeni S.M.Kirova. Predstavlena seminarom Nauchno-issle-
dovatel'skogo instituta vysokikh napryazheniy i kafedry tekhniki
vysokikh napryazheniy.

(Electric discharges)

(Dielectrics)

KALYATSKIY, I.I., kand. tekhn. nauk; RUMYANTSEV, D.D., inzh.

Filament voltage transformer. Vest. elektroprom. 34 no.7:70-
71 J1 '63. (MIRA 16:8)

ANDREYEV, G.A.; KALYOTSKIY, I.I.

Electric strength of certain coals of the Kuznetsk Basin.
Izv. SO AN SSSR no.5 Ser. tekhn. nauk no.2:25-29 '64.

(MIRA 17:10)

1. Tomskiy politekhnicheskii institut.

ACCESSION NR: AP4033122

S/0120/64/000/002/0108/0109

AUTHOR: Barantsev, V. S.; Kalyatskiy, I. I.; Kleyn, R. E.

TITLE: Mobile 300-kv 10-cps pulse generator

SOURCE: Pribery* i tekhnika eksperimenta, no. 2, 1964, 108-109

TOPIC TAGS: surge generator, pulse generator, 300 kv : pulse generator,
10 cps pulse generator, mobile 300 kv pulse generator

ABSTRACT: A 300-kv pulse generator with a 10^{-7} -sec front and a repetition frequency of 10 cps, intended for "special application," is briefly described. An LC charging circuit, charging choke coils, and separation inductances are used. "The generator satisfactorily passed a cycle of tests with a short-circuited load, at 15 cps and an amplitude of 300 kv." Data given: front duration, 0.2×10^{-6} sec; number of stages, 7; capacitor type, KBGP-10, 0.5; impact capacitance, 18 nf; charging choke, 65 h; separation inductance, 1.43 mh; pulse energy, 800 joules. Orig. art. has: 2 figures and 1 formula.

Cord-1/2

ACCESSION NR: AP4033122

ASSOCIATION: Tomskiy politekhnicheskiy institut (Tomsk Polytechnic Institute)

SUBMITTED: 30 May 63

ATD PRESS: 3065

ENCL: 00

SUB CODE: EC

NO REF SOV: 000

OTHER: 000

Card 2/2

KALITATSKII, I.I.; KRIVKO, V.V.

Pressure chambers operating under high pulse voltage. Prib. i
tekh. eksp. 9 no.4:190-192 J1-Ag '64. (MIRA 17:12)

1. Tomskiy politekhnicheskii institut.

ACCESSION NR: AP4013427

S/0057/64/034/002/0348/0351

AUTHOR: Kalyatskiy, I.I.; Kassirov, G.M.

TITLE: Investigation of the effect of electrode material on pulse breakdown of a high-vacuum gap

SOURCE: Zhurnal tekhn.fiz., v.34, no.2, 1964, 348-351

TOPIC TAGS: breakdown, pulse breakdown, high-vacuum breakdown, electrode material, graphite electrode, lead electrode, copper electrode, aluminum electrode, steel electrode, aluminum steel electrode

ABSTRACT: The breakdown of a 1 mm high vacuum gap between a 20 mm diameter hemispherical cathode and a plane anode was investigated with voltage pulses having rise times from 0.2 to 4 microsec. A pressure less than 2×10^{-5} mm Hg was maintained in the gap, and electrodes of graphite, lead, copper, aluminum and steel were investigated. The pulses were produced by discharge of a 100 kV capacitor, and the rise times were controlled by an R-C circuit. The potential across the gap was measured and the breakdown was observed with an oscilloscope. The breakdowns occurred during the rise of the pulse, and the earlier, the steeper the pulse. Breakdown

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ACCESSION NR: AP4013427

times of 0.1 microsec were achieved with all the electrode materials. The 0.1 microsec "pulse coefficient", i.e., the ratio of the breakdown potential at 0.1 microsec delay to the static breakdown potential, ranged from 1.93 for copper to 2.9 for graphite electrodes. Except for the steel electrodes, which did not follow this rule, the pulse coefficient increased with decreasing Young's modulus of the electrode material. The curves of breakdown potential versus delay time were convex to the time axis, except for steel electrodes. The steel electrode curve was slightly concave. Breakdown between aluminum and steel electrodes was investigated, each material serving in turn as anode. The breakdown potential for very short delay times was approximately that characteristic of the anode material, and the shape of the delay time curves was reminiscent of that obtained when both electrodes were of the cathode material. It is considered difficult to reconcile the observed short delay times with Cranberg's hypothesis concerning vacuum breakdown (L.Cranberg, J. Appl.Phys.23,518,1952) because of the long time required for a material particle to traverse the gap. "In conclusion, the authors express their gratitude to engineer B.M.Koval'chuk for participating in the preliminary experiments." Orig.art.has: 3 figures and 1 table.

2/3

Card

ACCESSION NR: AP4013427

ASSOCIATION: Tomskiy politechnicheskiy institut im. S.M.Kirova (Tomsk Polytechnic Institute)

SUBMITTED: 12Dec62

DATE ACQ: 26Feb64

ENCL: 00

SUB CODE: PH

NR REF SOV: 005

OTHER: 001

Card 3/3

ACCESSION NR: AP4042937

S/0057/64/034/008/1471/1475

AUTHOR: Kalyatskiy, I.I.; Kassirov, G.M.

TITLE: Investigation of pulse flashover of several solid dielectrics in vacuo

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.8, 1964, 1471-1475

TOPIC TAGS: insulating material, flashover, sparkover, dielectric, particle accelerator

ABSTRACT: In order to obtain data that might be useful in the design of accelerators and other high-vacuum high-voltage equipment, the authors measured the vacuum pulse flashover (sparkover) potentials of teflon, a vinyl plastic, an epoxy resin, and an acrylic resin for pulse durations from 0.1 to 3 microsec. The apparatus is described elsewhere (I. I. Kalyatskiy and G. M. Kassirov, Izv. VUZov, Fizika No. 4, 1963). The flashover always occurred during the rise of the pulse. The only information given concerning pulse shape is a single oscillogram; in this case flashover occurred while the pulse was still rising at about half its initial rate. The specimens were 1.5 cm diameter cylinders from 0.5 to 2 cm long. The surfaces were worked with fine emery paper, polished, washed with benzene and alcohol, and the specimens were placed

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ACCESSION NR: AP4042937

in the discharge chamber between 4.5 cm diameter aluminum electrodes. The specimens were subjected to a cleansing discharge, and the flashover potentials were measured both with increasing and with decreasing pulse duration. The flashover potential increased with the length of the specimen, but not quite proportionately. Pulse factors (ratio of pulse to steady spark potential) of 2 to 5 were obtained with 0.1 microsec pulses. At 1.5 microsec the pulse factors, except for teflon, were less than 1.65. These pulse factors are close to those obtained for ceramic materials under similar conditions by M.Kofoid (Power Apparatus and Systems No.6,999,1960). Although for most of the materials the pulse factor decreased monotonically with increasing pulse duration, for Plexiglas the pulse factor reached a minimum of 1.33 at about 1.5 microsec and increased to approximately 2 at 3 microsec. The authors suggest that some of the other materials may have similar minima at longer pulse durations, beyond the range of their measurements. Measurements were made with polished aluminum, ground aluminum, and graphite electrodes; no differences were found. Reducing the cathode diameter to 1.5 cm increased the flashover potential for short pulses by a factor 2; reducing the anode diameter had very little effect. Specimens with carefully polished surfaces flashed over at a 30 to 40% lower potential than those whose surfaces had been worked with fine emery. Orig.art.has: 6 figures.

2/3

ACCESSION NR: AP4042937

ASSOCIATION: Tomskiy politekhnicheskii institut im. S.M.Kirova (Tomsk Polytechnic Institute)

SUBMITTED: 09Jul63

ENCL: 00

SUB CODE: EE, NP

NR REF SOV: 002

OTHER: 003

3/3

KALYATSKIY, I.I.; LIMASOV, A.I.

Study of the pulse electric strength of some solid dielectrics
of great thickness. Izv. SO AN SSSR no.2, Ser. tekhn. nauk no.1:
79-84. '64. (MIRA 17:8)

1. Transportno-energeticheskiy institut Sibirskogo otdeleniya
AN SSSR, Novosibirsk.

L 22272-66 EWT(1)

ACC NR: AR6005186

SOURCE CODE: UR/0058/65/000/009/G017/G017

AUTHORS: Yorob'yev, A. A.; Kalyatskiy, I. I.; Krivko, V. V.; 64
Cheplikov, A. T. B

TITLE: Pulsed electric breakdown of air and water vapor at increased pressures

SOURCE: Ref. zh. Fizika, Abs. 9G143

REF. SOURCE: Sb. Proboy dielektrikov i poluprovodnikov. M.-L., Energiya, 1964, 103-106

TOPIC TAGS: dielectric breakdown, electric discharge, gas discharge, water vapor, pressure

TRANSLATION: Experimental volt-second characteristics are obtained of the electric breakdown of air and water vapor at different pressures (1 -- 4 atm) for application times in the range (2 -- 20) $\times 10^{-7}$ sec. Pulses of positive and negative polarity with amplitudes up to 400 kv were applied on a point secured at a distance 4 -- 20 mm

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L 22272-66

ACC NR: AR6005186

from a grounded plane. The time of action of the pulse voltage was measured from the oscillograms. It is established that the pulsed strength of dry water vapor at increased pressure exceeds the strength of air, especially for pulses of negative polarity. For water vapor, no reduction was observed in the dielectric strength of the gap in the pressure region 10 -- 20 atm, such as is characteristic of breakdown in air. I. Popov

SUB CODE: 20

Card

2/2 est

L 14028-66

ACC NR: AP6002019 (A) SOURCE CODE: UR/0288/65/000/003/0151/0154

AUTHOR: Kalyatskiy, I. I.; Dul'zon, A. A.; Zhelezchikov, B. P. /3

ORG: Tomsk Polytechnic Institute (Tomskiy politekhnicheskiy institut) B

TITLE: Distortion of high-voltage unipolar impulses in a coaxial cable

SOURCE: AN SSSR. Sibirskoye otdeleniye. Izvestiya. Seriya tekhnicheskikh nauk, no. 3, 1965, 151-154

TOPIC TAGS: electric impulse, coaxial cable, electric power cable

ABSTRACT: The results of an experimental investigation of attenuation and distortion of the impulses propagating in a hard-insulation coaxial cable are reported. A 530-m length of RK-103 polyethylene-insulated cable was tested with impulses having a front duration between 7.5 nsec and 0.6 μ sec. These tests showed that: (1) A corona with gradients up to 50 kv/mm does not essentially change the attenuation and distortion of the impulse; (2) Calculation of attenuation and distortion of impulses having the above voltage gradient can be performed by the same methods which are used for such calculations in the no-corona case. "The authors wish to thank Professor D. V. Razevig for his advice." Orig. art. has: 4 figures.

SUB CODE: 09 / SUBM DATE: 15Feb65 / ORIG REF: 019 / OTH REF: 003

Card

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I. 44593-66 EWT(1)/EWT(m)/T IJP(c) DS/DJ/GG
 ACC NR: AR6010509 SOURCE CODE: UR/0196/65/000/010/B008/B008

AUTHOR: Kalyatskiy, I. I.; Panin, V. F.

TITLE: Pulsed electrical breakdown of parallel systems of air and a liquid dielectric

SOURCE: Ref. zh. Elektrotehnika i energetika, Abs. 10B49

REF SOURCE: Sb. Probay dielektrikov i poluprovodnikov. M.-L., Energiya, 1964, 240-243

TOPIC TAGS: dielectric breakdown, liquid dielectric

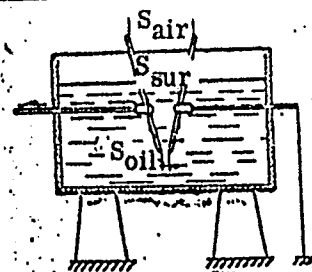
ABSTRACT: The comparative pulse resistance of interelectrode "rod-rod" gaps is investigated (see figure for a sketch of the arrangement of the electrode system) arranged in air S_{air} , transformer oil S_{oil} , and at the boundary between the "air-liquid" media S_{sur} . By varying the ratio of the gaps S_{air} , S_{sur} , and S_{oil} , interelectrode gaps of equal resistance were determined, i.e., such 2 gaps between S_{sur} and S_{air} , or S_{sur} and S_{oil} , each of which would be penetrated in 8-12 pulses out of 20. For gaps of equal resistance, a 50% discharge voltage was determined (the time of the effect of the voltage was 1; 5.5; and 55 μ sec). The difference in penetrating voltages S_{air} and S_{sur} increases as the distances between the electrodes increase, and as the time of effect of the voltage decreases. The ratio of gaps of equal resistance, S_{sur}/S_{oil} , decreases sharply as the discharge voltage increases (which corresponds to an increase in distance). The decrease in the difference in resistances of gaps S_{sur}

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UDC: 621.315.615.2+621.315.618.2:621.3.015.51

L 44593-66

ACC NR: AR6010509



and S_{oil} occurs more considerably when the time of effect of the voltage increases, which is explained by the different steepness of the volt-second characteristics of the air and oil in the field of short discharge times. The ratio of gaps of equal resistance, S_{sur}/S_{air} , in the field of the effect from 1 to 5.5 μsec remains practically unchanged. An increase in this ratio with an effect time of 55 μsec , presumably, is associated with an increase in the surface ion discharges in the regions at the electrodes. [Translation of abstract] 4 illustrations and bibliography of 6 titles. [Tomsk Polytechnical Institute im. S. M. Kirov (Tomskiy politekhnich. in-t)] A. Petrashko

SUB CODE: 20

Card 2/2 *20m*

L 04259-67 EWT(1) IJP(c) GG

ACC NR: AR6010507

SOURCE CODE: UR/0196/65/000/010/B007/B007 42
41
13

AUTHOR: Gavrilin, A. I.; Kalyatskiy, I. I.; Sinebryukhov, A. G.

TITLE: Investigation of the power characteristics of pulsed breakdown of solid dielectrics

SOURCE: Ref. zh. Elektrotehnika i energetika, Abs. 10B44

REF SOURCE: Sb. Proboy dielektrikov i poluprovodnikov. M.-L., Energiya, 1964, 166-170

TOPIC TAGS: dielectric breakdown, solid dielectric, dielectric property

ABSTRACT: In connection with the prospective use of spark-discharge (SD) energy for various engineering purposes, the study of the power characteristics of pulsed SD in solid dielectrics and a comparison of them with the characteristics of SD in gases and liquids is of interest. The variation in the quantity of energy liberated in a discharge channel in breakdown of rock salt crystals as a function of the magnitude of excess voltage is shown in Fig. 1. The maximum rate of liberation of energy in breakdown of solid dielectrics is a direct function of the maximum steepness of current build-up. The energy and capacity of the pulsed spark in solid dielectrics may be regulated by varying the amplitude of the voltage pulses fed to the sample during breakdown. Such regulation is possible only within a definite interval, the lower limit of which is determined by the breakdown voltage of the solid dielectric. In connection with this, the

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UDC: 621.315.61:537.52

L 04259-67

ACC NR: AR6010507

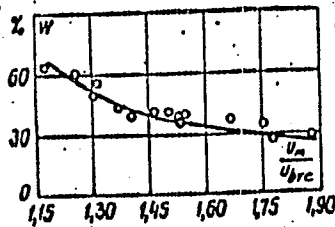


Fig. 1

The energy liberated in the discharge channel when $R_{ret} = 46$ ohm is reduced by 25%. The minimum value of the discharge-channel resistance is determined by the magnitude of excess voltage and when $n = 1.2-1.4$ amounts to 25-70 ohm. The time of establishment of the minimum value of discharge resistance in the time of the first half-period depends upon R_{ret} .

possibility of regulating the power characteristics of SD by introduction of a retarding resistance R_{ret} was investigated. For the experiments, specimens of rock salt 20 mm thick were used, to which voltage pulses with an amplitude of 165 kv were fed from a pulsed voltage generator, having an impact capacitance of 0.002 μ f. The inductivity of the discharge circuit remained unchanged and amounted to 10^{-5} H. The introduction of R_{ret} into the discharge circuit leads to a considerable decrease in the current amplitude I_m (curve 2, Fig. 2) and the maximum rate of liberation of energy in the discharge channel P_m (curve 1).

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L 04259-67

ACC NR: AR6010507

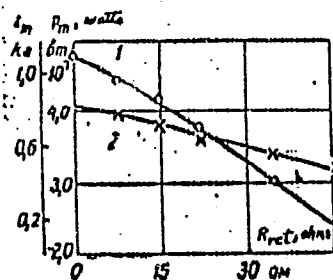


Fig. 2

hooked up into the discharge circuit. [Translation of abstract] 6 illustrations, 1 table and bibliography of 17 titles. [Tomsk Polytechnical Institute im. S. M. Kirov (Tomskiy politekhnich. in-t)] A. Petrashko

SUB CODE: 20

Card 3/3 f v

KALYAVIN, V.A.; SMOLINA, T.A.; REUTOV, O.A.

Bromine anion catalysis of the monomolecular isotope exchange
of benzyl mercury halides with mercury halide. Dokl. AN SSSR
157 no.4:919-921 Ag '64 (MIRA 17:8)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova
i Institut elementoorganicheskikh soyedineniy AN SSSR. 2. Chlen-
korrespondent AN SSSR (for Reutov).

KALYAVIN, V.A.; SMOLINA, T.A.; REUTOV, O.A.

Mechanism of isotopic exchange between organomercury salts and mercury halide. Dokl. AN SSSR 155 no. 3:596-599 Mr '64.

(MIRA 17:5)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova i Institut elementoorganicheskikh soyedineniy AN SSSR. 2. Chlen-korrespondent AN SSSR (for Reutov).

KALYAVIN, V. A.; SMOLINA, T. A.; REUTOV, O. A.

Monomolecular mechanism of isotopic exchange between benzylmercuri halides and radioactive mercury halides. Dokl. AN SSSR 156 no. 1:95-98 My '64. (MIRA 17:5)

1. Moskovskiy gosudarstvennyy universitet im. Lomonosova i Institut elementoorganicheskikh soyedineniy AN SSSR.
2. Chlen-korrespondent AN SSSR (for Reutov).

SHAKHKEL'DYAN, B.N.; KALYAVINA, L.F.

Deformation of a paint film in the cupping of tin. Lakokras.mat.1
ikh prim. no.5:45-49 '60. (MIRA 13:11)

(Paint--Testing)

REUTOV, O.A.; SMOLINA, T.A.; KALYAVIN, V.A.

Isotopic exchange reaction of benzylmercury bromide with Hg^{203}
-tagged mercuric bromide. Zhur. fiz. khim. 36 no.1:119-
123 Ja '62. (MIRA 16:8)

1. Moskovskiy gosudarstvennyy universitet im. Lomonosova i
Institut elementoorganicheskikh soyedineniy AN SSSR.
(Mercury—Isotopes) (Mercury organic compounds)

REUTOV, O.A.; SMOLINA, T.A.; KALYAVIN, V.A.

Isotopic exchange reaction between substituted benzylmercury bromides and mercuric bromide tagged with the Hg^{203} radioactive isotope. Dokl. AN SSSR 139 no.2:389-392 J1 '61. (MIRA 14:7)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova i Institut elementoorganicheskikh soyedineniy AN SSSR. 2. Chlen-korrespondent AN SSSR (for Reutov).
(Mercury bromide) (Mercury--Isotopes)

SMOLINA, T.A.; KALYAVIN, V.A.; REUTOV, O.A.

Isotope exchange between allyl mercury bromide and cinnamyl
mercury bromide. Izv. AN SSSR. Ser. khim. no.12:2235 D '63.
(MIRA 17:1)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova
i Institut elementoorganicheskikh soyedineniy AN SSSR.

SHAKHKEL'DYAN, B.N.; KALYAVINZ, L.F.; SINEGUB-LAVRENKO, A.A.

Changes in the mechanical properties of printing inks taking place in the process of aging [with summary in English].
Koll.zhur. 23 no.4:491-494 J1-1g '61. (MIRA 14:8)

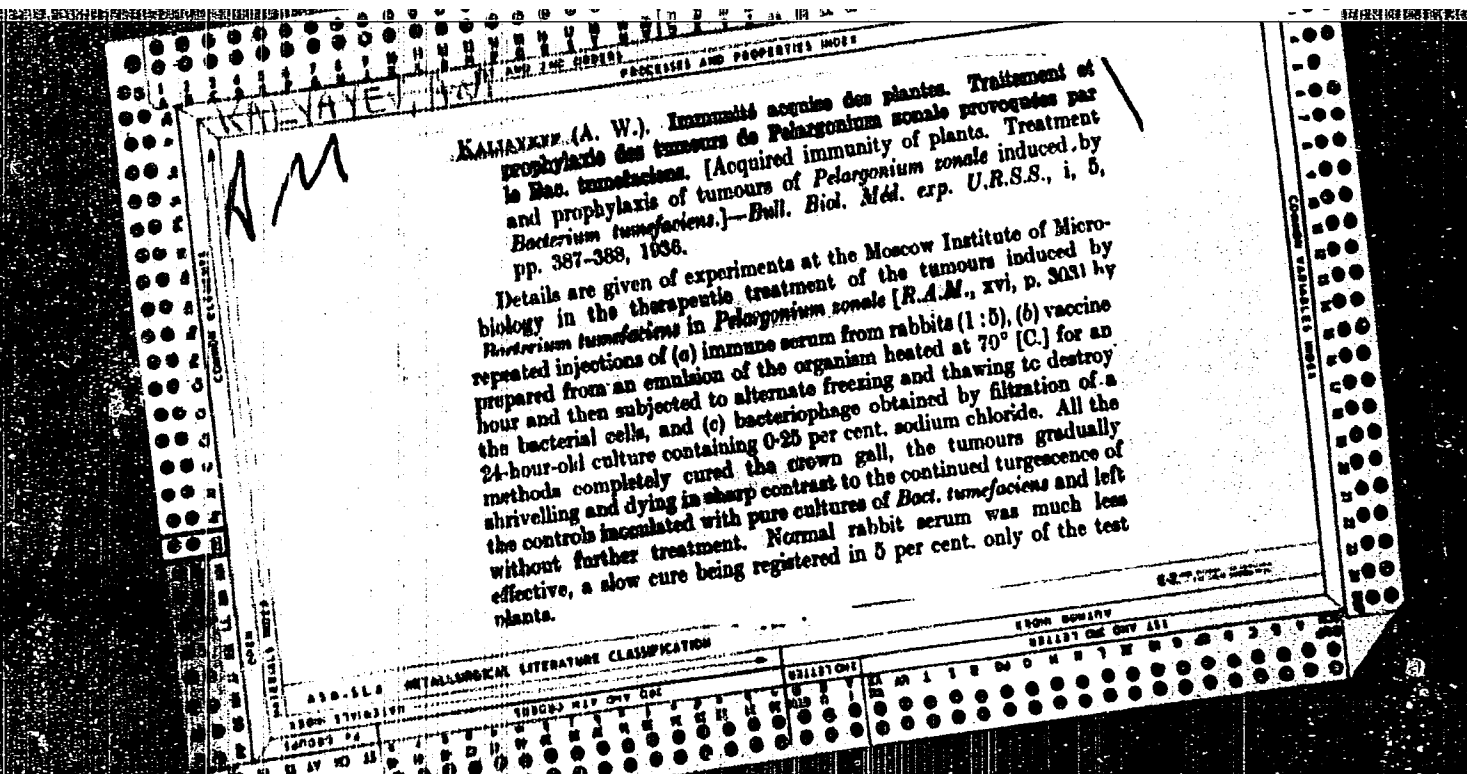
1. Nauchno-issledovatel'skiy khimicheskiy institut promyshlennosti mestnogo podchineniya, Moskva.
(Printing ink)

KALYAYEV, A.; USANOVA, Ye.

"Laboratory Methods in Soviet Sanitation Practices," Meditsinskiy Rabotnik,
Vol 17, No 96 30 Nov 1954, p 2.

Laboratory physician, Yeniseysk Sanitation Epidemiological Station.

Translation W-31326, 28 Jun 54



KALYAYEV, A. V.
KALIAEV, A. V.

Feb 1947

USSR/Permafrost
Medicine - Bacteria

"Anabiosis Under Conditions of Frozen Ground,"
A. V. Kaliev, 4 pp

"Mikrobiologiya" Vol XVI, No 2

Study of the ever frozen ground of the Vorkuta
district and on cultures of bacteria isolated from
these regions.

8115

1144747E V, A.V.

USSR/Virology - Human and Animal Viruses.

E-3

Abs Jour : Ref Zhur - Biol., No 4, 1958, 14566

Author : Gutman, N.R., Kalyaev, A.V.

Inst : -

Title : Strains of Grippe Virus A' Isolated in 1956.

Orig Pub : Vopr. virusologii, 1957, No 3, 148-151

Abstract : The epidemic in Moscow of March 1956, was caused by a grippe virus, type A', close in antigenic structure to virus type A' of 1953. All the strains were apathogenic to mice. No differences were noted in the morphology of all 10 strains. By electron microscopy the virus was found to be in the form of elementary small bodies and threadlike forms.

*Dept. Virology, Moscow Sci Res. Inst Vaccine & Sera
im. I. I. Mechnikov*

Card 1/1

KALYAYEV, A.V.

USSR / Virology. Human and Animal Viruses. Influenza Virus. E

Abs Jour: Ref Zhur-Biol., No 2, 1959, 5339.

Author : Gutman, N. R.; Kalyayev, A. V.
Inst : Moscow Scientific Research Institute of Vaccines
and Sera.
Title : New Strains of Influenza A₁ Virus.

Orig Pub: Tr. Mosk. n.-i. in-ta vaktsin i syvorotok, 1957,
9, 29-31.

Abstract: No abstract.

Card 1/1

3325. A d.c. instrument transformer. I. A. ZAKHAROV, A. V. KALYAZOV, *Elektricheskoye*, 1964, No. 2, 21-5. In Russian.

The d.c. instrument transformers so far suggested are unsatisfactory not only because they fail to represent the form of the primary voltage or current curve satisfactorily, but also because they are influenced by the amplitude variations and frequency of the auxiliary alternating voltage. The authors show that by the use of the principle of a frequency doubler working in conditions very near to s.c. conditions, the mentioned disadvantages may be eliminated and a d.c. transformer working satisfactorily within wide limits can be designed. Further advantages are ease of design, simple and cheap construction, since the core of the ferromagnetic frequency doubler can consist of ordinary electrical steel, and lowness of the systematic error of the apparatus (in a model for 500 A and 50-60 W of a fairly crude design it did not exceed 2%). The operation of the transformer is also unaffected by magnetic fields and ambient temperature variations.

D. P. KRAUS

9.3220

S/112/59/000/012/003/097
A052/A001

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1959, No. 12, p. 6,
23962

AUTHORS: Pukhov, G. Ye., Kalyayev, A. V.

TITLE: Determination of Initial Conditions of Differential Equation of a
Composite Electric Circuit ²⁵

PERIODICAL: Tr. Taganrogsk. radiotekhn. in-ta, 1957, 3, No. 2, pp. 129-137

TEXT: A method of direct calculation of initial values of currents of a composite circuit is exposed. Thereby the starting initial conditions for the system of circuit equations are represented in the form of initial values of full flux linkages in each of independent circuits Ψ_a and in the form of a sum of initial voltage values U_{sc} on the capacitors contained in each of the circuits. Recurrent formulae are given which permit the determination of initial values of the current sought for and its derivatives one after another. ✓B

T. T. S.

Translator's note: This is the full translation of the original Russian abstract.

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16(1)

SOV/44-59-1-426

Translation from : Referativnyy zhurnal. Matematika, 1959, Nr 1, p 85 (USSR)

AUTHOR: Kalyayev, A.V.

TITLE: On the Calculation of Stationary Processes in Non-linear Systems

PERIODICAL: Tr. Taganrogs. radiotekhn. in-ta, 1957, 3, Nr 2, 139 - 143

ABSTRACT: Not abstracted in the original.

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C111/C222

AUTHOR: Kalyayev, A.V.

TITLE: Graphical-analytic method for the integration of nonlinear differential equations

PERIODICAL: Referativnyy zhurnal. Matematika, no.7, 1960, 225.
Abstract no.8309. Tr.Taganrogsk.radiotekhn,in-ta, 1958,2,
111-123

TEXT: The author proposes a graphical analytic method for the solution of nonlinear differential equations of first and higher orders. In the latter case the equation is reduced to the corresponding system of equations of first order. The proposed method is called the method of the sliding triangle; it consists in the fact that instead of the usual graphical construction of the first approximation according to Euler and the application of the additional half step, a characteristic triangle is constructed in every partial variation interval of x . Thereby the construction is not simplified as it is stated by the author but it becomes more difficult since additional lines parallel to the coordinate axes must be drawn. It is evident that thereby the exactness of the graphical solution is diminished too, particularly for the

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Graphical-analytic method for the...

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solution of systems of equations.

[Abstracter's note: The above text is a full translation of the original
Soviet abstract.] ✓

Card 2/2

AUTHOR: *ANATOLY VASIL'YEVICH*
Kalyayev, A.V., Candidate of Technical Sciences, Docent SOV/144-58-10-1/17

TITLE: Analysis of Transients in Nonlinear Dynamic Systems
(Analiz perekhodnykh protsessov v nelineynykh
dinamicheskikh sistemakh)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Elektromekhanika,
1958, Nr 10, pp 3-11 (USSR)

ABSTRACT: The system (of automatic control) is described by Eq (1),
subject to the initial conditions (2) which are assumed
given. It is then assumed that the function in Eq (1)
is a polynomial in the arguments, in which polynomial
the powers are integers. It is also assumed that y_H
is zero in the steady state (all the other y 's are
derivatives with respect to time). It is proposed to
solve this nonlinear differential system in terms of an
approximate function (shown by broken lines in Fig 1;
the full line is the exact solution for the transient
response): a convenient approximating function is that
of Eq (3) and the resulting error is given by Eq (4),
subject to condition (5). Now Eq (3) is also the
solution to the linear differential equation (6) with
initial conditions (7) which latter may be derived from

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Analysis of Transients in Nonlinear Dynamic Systems

Eq (1) and (2). The argument then turns to the ways of finding the coefficients b_k in Eq (6). The first method is to substitute the function y_H of Eq (1) into the approximating function (6) which gives an error defined by Eq (9); this error is minimised by choosing the b_k appropriately. The usual methods are applied to minimise the integral of the square of the error. The second method is to reverse the process i.e. to substitute the approximating function into the exact differential equation. This second method has the advantage that certain awkward integrals are avoided. The appendix deals with a system with a nonlinear feedback of the type shown in Fig 2. The full curves in Fig 3 and 4 have been derived by numerical methods; the broken curves have been found by the two methods of approximation. There

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Analysis of Transients in Nonlinear Dynamic Systems

are 4 figures and 1 Soviet reference.

ASSOCIATION: Taganrogskiy radiotekhnicheskiy institut
(Taganrog Institute of Radio Engineering)

SUBMITTED: 18th October 1958

Card 3/3

SOV/144-59-6-4/15

AUTHORS: Kalyayev, A.V. Panov, D.N. and Sukhomlinov, M.M. Candidates

TITLE: of Technical Sciences
A Converter of Continuous Electrical Quantities Into a
Digital Form

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika,
1959, Nr 6, pp 25 - 33 (USSR)

ABSTRACT: The authors describe an analogue-to-digital converter of their own design. The converter is based on the transformation of continuous function $y(t)$ into a sequence of pulses having a frequency f such that f is proportional to $y(t)$. It is possible to design digital integrators and differentiators by employing the same principle. The basic converter, whose output is given in the form of a discrete binary code, is illustrated by the block schematic of Figure 5. This consists of a detector Δ which converts the input function $y(t)$ into its modulus $|y(t)|$, a converter of the modulus $|y(t)|$ into a train of pulses Π , a reversible counter PC , a pulse generator Γ , an electronic switch \mathcal{P} and a delay circuit \mathcal{D} . The functioning of the device is as follows. The converter of $y(t)$ into a train of pulses

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A Converter of Continuous Electrical Quantities Into a Digital Form

can be only operated with positive voltages. Consequently, it is necessary to form the modulus $|y(t)|$. This is accomplished in the detector. The modulus is now converted into a train of pulses which is applied to the reversible counter PC . Since the counter should add the pulses corresponding to the positive values $y(t)$ and subtract the pulses corresponding to the negative values of $y(t)$, the counter is controlled by an electronic switch. This applies an "adding" signal during the positive values of $y(t)$ and a subtraction signal during the negative values of $y(t)$. The pulses are added (or subtracted) during a fixed interval Δt . This is done by controlling the operation of a counter by means of the timer-generator Γ . The timer periodically "discharges" the counter and transfers the number of pulses recorded in the counter into a memory device. After the transfer of the information into memory, the counter is re-set by the timer through the delay circuit. The system of Figure 5 can be employed to carry out a functional transformation of $y(t)$ if a "functional transformer" is inserted at the input of the

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system. It is possible, however, to achieve the transformation if the frequency of the output pulses is made functionally dependent on $y(t)$, i.e. $f = F(y)$. An integrating circuit can easily be constructed. For this purpose, it is necessary to interrupt the line of the delay circuit in Figure 4. In this case, the reversible counter will continuously add on the pulses obtained from the output of the pulse converter. This process is equivalent to an approximate integration. The system of Figure 5 can also be employed as a differentiator. For this purpose, it is necessary to add a flip-flop circuit and two switches K , which operate in accordance with the logic sequence indicated in the table in Figure 6. The most important element of the converter of Figure 5 is the $y(t)$ -to- f transformer. This can take the form of the circuit described by V.I. Ryzhov (Ref 1). It is possible, however, to devise more satisfactory transformers by employing an inductively coupled multivibrator (Refs 3-4). A multivibrator of this type, based on two vacuum tubes, is shown in Figure 8. Another satisfactory transformer circuit,

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A Converter of Continuous Electrical Quantities Into a Digital Form
based on two transistors, is indicated in Figure 9;
the relationship between the input voltage (to be converted
into digits) and the frequency of the output pulses is
linear over a wide range of voltages, as can be seen from
the graph in Figure 9.
There are 9 figures and 4 references, of which 3 are
Soviet and 1 English.

ASSOCIATION: Taganrogskiy radiotekhnicheskiy institut
(Taganrog Radiotechnical Institute)

SUBMITTED: April 21, 1959

Card 4/4

KALYAYEV, A.V.; STANISLAVSKIY, Ye.S.

Results of the 3rd All-Union Conference on Electron Microscopy.
Zhur. mikrobiol. epid. i immun. 32 no.7:155-157 Je '61. (MIRA 15:5)
(ELECTRON MICROSCOPY--CONGRESSES)

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E194/E435

Anatoliy Vasil'yevich

AUTHOR: Kalyayev, A.V., Candidate of Technical Sciences, Docent

TITLE: A Frequency Impulse Convertor of Continuous
Electrical Magnitudes

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,
Elektromekhanika, 1961, No.3, pp.17-49

TEXT: This article provides a detailed analysis of circuits that transform a continuous alternating voltage into a sequence of impulses of which the frequency is proportional to the input magnitude. The main design formulae are derived and experimental results are given. Often in using discontinuous control and impulse servo systems, it is necessary to convert continuous electrical magnitudes into a definite succession of impulses. One way of doing this is to use a frequency-impulse convertor, the frequency of the output signals of which bears a linear relation to the input magnitudes. Another way of doing this is to use a symmetrical multi-vibrator circuit with inductive negative feedback based on vacuum or semiconductor triodes and magnetic cores with rectangular hysteresis loop. This article gives a detailed analysis of a circuit based on vacuum tubes (Fig.1) and makes
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allowance for non-linearity both of the triodes and of the core. It is assumed that the core is of permalloy and that its hysteresis loop may be characterized approximately by straight lines as shown in Fig.2 so that each section of the loop corresponds to a linear functional relationship between the flux and the magnetomotive force. For the purposes of further analysis the loop is sub-divided into four sections denoted by Roman numerals in Fig.2 and relationships between the flux and the m.m.f. are written down for each section. As the circuit works over a wide range of triode parameters, it is necessary to allow for the relationship between the anode current of the triode on the one hand and its anode and grid voltages on the other hand.

$$i_a = f(u_a, u_c) \quad (5)$$

In this case, the usual representation of Eq.(5) as a family of anode and anode-grid characteristics is inconvenient and accordingly the surface $i_a = f(u_a, u_c)$ is considered in the general form in coordinates of i_a , u_a and u_c . A simple approximation to the surface $i_a = f(u_a, u_c)$ is to represent it in Card 2/22

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the form of plane sections, as shown in Fig.3, in which the double hatched area corresponds to saturation, the horizontal hatched area above the line u_a corresponds to the working region and that below this line to the region of blocking. It is also convenient to project the approximating surface on to the plane (u_a, u_c) as is done in Fig.4, in which the line ABCD is the trajectory of the working point. As the frequency range of the frequency-impulse convertor does not usually exceed some tens of kilocycles, it is permissible to neglect stray capacitances of the circuit and leakage reactances of the windings and also the ohmic resistance of the core. It is then shown that the trajectory of the working point of the tube in coordinates (u_a, u_c) is a straight line as shown in Fig.4, and expressions are derived for the anode current and the anode and grid voltages corresponding to the point of intersection of the working line with the boundary between the operating region and that of saturation. The principal equations of operation of the frequency-impulse convertor are then formulated taking as initial time an instant at which the flux in the core commences to increase from a certain negative value $-\Phi_{\max}$ (Fig.2).

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Equations are derived for the different sections of the loop. For the first section, equations are derived for currents, voltages, m.m.f. and flux in the core. It is pointed out that since the time taken for the flux to reach the value Φ_1 is much less than T_1 where

$$L_1 = L_1 \left(\frac{w_a^2}{R_s} + \frac{w_2^2}{R_2} + \frac{w_c^2}{R_c} \right). \quad (38) \quad (38)$$

the following simplified expression may be obtained for the flux and magnetomotive force

$$F = - \left[\frac{E_a}{w_a} \left(\frac{w_2^2}{R_2} + \frac{w_c^2}{R_c} \right) + \frac{w_c E_c}{R_c} \right] + \frac{E_a(t-t_0)}{w_a L_1}, \quad (40)$$

$$\Phi = -\Phi_r - L_1 \left[\frac{E_a}{w_a} \left(\frac{w_2^2}{R_2} + \frac{w_c^2}{R_c} \right) + \frac{w_c E_c}{R_c} \right] + \frac{E_a(t-t_0)}{w_a} - \frac{E_a(t-t_0)^2}{2w_a L_1 \left(\frac{w_a^2}{R_s} + \frac{w_2^2}{R_2} + \frac{w_c^2}{R_c} \right)}. \quad (41)$$

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Whilst the currents and voltages are given by

$$i_{a1} = \frac{E_a}{R_c} \left[1 - e^{-\frac{(t-t_0)}{T_1}} \right], \quad (32)$$

$$u_{a1} = E_a \left[1 - e^{-\frac{(t-t_0)}{T_1}} \right], \quad (33)$$

$$e_2 = -\frac{w_2 E_a}{w_a} e^{-\frac{(t-t_0)}{T_1}}, \quad (34)$$

The second and third sections of the loop are then considered and corresponding equations are derived for them. The expressions derived so far include values of the maximum flux and m.m.f. (Φ_{\max} and F_{\max}). Accurate expressions are first derived but if, in Fig.1, $E_c = 0$ and R_2 is infinity, the following relatively simple expressions are obtained

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$$F_{\text{max}} = \frac{w_c E_a}{R_c} \left[\frac{\mu w_a R_c - w_c (R_l - R_s)}{(R_l - R_s) w_a + \mu w_c R_s} \right], \quad (73)$$

$$\Phi_{\text{max}} = \Phi_r + \frac{L_1 w_c E_a}{R_c} \left[\frac{\mu w_a R_c - w_c (R_l - R_s)}{(R_l - R_s) w_a + \mu w_c R_s} \right]. \quad (74)$$

Further simplification of these equations is possible in special cases but care is required to avoid excessive error. The conditions of excitation of the convertor are then considered. The previous analysis has considered the condition of the circuit from the instant when the working point of the core is transferred from the second to the third section of the hysteresis loop until the instant at which the working point of the left hand triode passes from the saturation to the working region, as shown in Fig.4. At this point, the current in the valve reaches a limiting value and thereafter the process may develop in one of two ways, only one of which is however of practical importance. In this case, the slope of the working trajectory is such that the limiting value of Card 6/22

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the current mentioned above is maximum and thereafter the valve current is reduced whether the working point passes into the region of saturation or to the working region. Under these conditions self-oscillation can be set up, in the first half period of which the left hand triode works and in the second half period the right hand triode. The various equations that have been derived so far remain valid under these conditions. In order that the auto-oscillatory process should develop, the slope of the working trajectory of the triode should be selected in such a way that the current reaches a maximum value on this trajectory. This condition is fulfilled if the angle of slope α of the working trajectory relative to the axis u_a is greater than the angle β formed by this axis and the straight line between the working and blocking regions, see Fig.6. For excitation of the circuit to occur, the following relationship must be fulfilled

$$\frac{\mu w_c}{w_a} = 1 \quad (80)$$

where w_a and w_c are respectively obtained from Card 7/22.

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$$u_a = E_a - w_a \frac{d\Phi}{dt} \quad (8)$$

$$u_c = E_c + w_c \frac{d\Phi}{dt} \quad (9)$$

which represent the valve anode and grid voltages respectively. A further condition for auto-oscillation to arise is then derived in the form of

$$\frac{\mu w_a}{w_c} > \frac{R_1 - R_s}{R_c} \quad (82)$$

The two conditions may be combined into the following single condition

$$\frac{1}{\mu} < \frac{w_c}{w_a} < \frac{\mu R_c}{R_1 - R_s} \quad (83)$$

It is deduced from this condition that triodes having a low Card 8/22

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coefficient of amplification and low grid resistance R_c are unsuitable for use in convertors of this kind. Provided that the condition of Eq.(83) is fulfilled, auto-oscillation develops in the circuit and curves of current, voltage m.m.f. and flux can be constructed. The period and frequency of auto-oscillation of the convertor are then considered and it is shown that there will be a linear relationship between the voltage E_a and the frequency f over a very wide range if the core used has a narrow rectangular hysteresis loop and high remanent induction. For correct operation of the frequency-impulse convertor, it is necessary that when one of the triodes is open and passing into the working condition, the second should be fully blocked; otherwise the range of linear proportionality between the voltage and frequency is restricted. It is accordingly necessary to consider the conditions under which both valves cannot be open simultaneously and reference is made to Fig.8. On this figure the point to the left and above point B is the working point of the left hand triode and the point to the right and below N is that of the right hand triode. For convenience the ordinate is plotted in terms of μ_c ✓

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instead of u_c . From consideration of this diagram and the appropriate equations it is shown that the input voltage E_a should not be less than a certain critical value given by the following equation

$$E_a \geq E_{\min} = \frac{\mu w_a R_i + (\mu w_c - 2w_a) R_s}{\mu w_c (R_i - 2R_s) - 2w_a (R_i - R_s)} E_c. \quad (105)$$

Operation of the convertor at low input voltages is then considered. When the input voltage is very low, convertor operation breaks down because the maximum value of the m.m.f. F_{\max} is less than F_2 and the working point of the core does not follow the complete hysteresis loop. The equations for the first section of the hysteresis loop remain unaltered but those for the second are different and it is for this reason that the proportionality between input voltage and frequency breaks down at low voltages. Thus the inductive multi-vibrator may have two operating conditions in the first of which F_{\max} is greater than F_2 , which is termed condition A, for which the input voltage is

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proportional to the frequency. Under the second condition when F_{max} is less than F_2 , which is termed condition B, the frequency relationship is not linear. The results derived so far may be used to construct a general curve of the relationship between the frequency f of the inductive multi-vibrator and the input-voltage E_a shown in Fig.11 (рисунок Б, A = operating condition B, A; $E_{a max} = E_a max$; $E_{a min} = E_a min$). It shows that there is a voltage $E_a min$ which is the boundary point between conditions A and B. It is obviously desirable that this minimum voltage should be as small as possible in practice. This minimum voltage is then analysed and it is shown that its value $E_a min$ may be reduced by reducing the m.m.f. F_2 , that is by making the core of a material with a very narrow hysteresis loop which is very rectangular, but both in theory and practice it is impossible that $E_a min$ should be zero and accordingly some change in the circuit is necessary. In particular, the circuit of Fig.13 may be used, containing an additional source of supply by means of which the input voltage may be reduced below $E_a min$. Of course, at low values of E_a there is some error but no great increase as before. Provided that $E_a max/E_a min$ is greater than 200 to 300, the error is only some tenths of a percent which is fully acceptable for practical purposes.

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The theoretical results were checked by an experimental study of a circuit of a frequency-impulse convertor based on a permalloy core and a vacuum triode type 6N8C(6N8S) and the results of this investigation are now given. The core is made up of permalloy rings, the section and mean length of the core were respectively $S = 30.2 \text{ mm}^2$ and $l_{av} = 9.4 \text{ cm}$. Five windings were wound on the core, two (included in the triode grid circuit) had $w_c = 160$ turns. The windings in the anode circuit had $w_a = 460$ turns. Finally, the secondary winding had $w_2 = 460$ turns. The hysteresis loop of the core was oscillographed and had the following main values: $H_c = 13.55 \text{ A/m}$, $B_r = 0.91 \text{ Wb/m}^2$, $F_c = 1.28 \text{ A}$, $\Phi_r = 2.75 \times 10^{-5} \text{ Wb}$. A double triode 6N8S was used. To determine the approximate characteristics and parameters of the triode the relationship $u_c(u_a)$ was determined for $i_a = \text{const}$, see curves of Fig.17. This graph also shows the boundaries between the region of blocking (a) the working region (b) and the saturation region (B). The following values were found for the triode from these results: $R_s = 400 \text{ ohms}$, $R_i = 8400 \text{ ohms}$, $R_c = 500 \text{ ohms}$, $\mu = 18.4$. Oscillograms of the wave shapes of the various magnitudes were compared with the theoretical curves, agreement is very good and it is concluded that the theoretical analysis is accordingly correct. In order to compare theoretical and experimental curves Card 12/22

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of $f(E_a)$, a calculation was made of the relationship between the auto-oscillation frequency of the convertor and the input voltage under both conditions A and B. The results are plotted in Fig.26 in which the theoretical curve is shown by a solid line and the experimental curve is shown dotted. The agreement is satisfactory. It will be seen that there is direct proportionality between the input voltage and frequency within the range of 20 to 150 V. On further increase of the input voltage the circuit loses stability because the triode is overloaded. In order to extend the range of proportionality the triodes were connected in parallel and, in theory, several triodes connected in parallel can replace a single equivalent triode with appropriate changes in the resistance values; thereby the minimum possible operating voltage for condition A is reduced. When several triodes are used in parallel, the lower limit of proportionality between frequency and input voltage is displaced towards the origin. This conclusion was confirmed by experiment and proportionality was maintained between 8 and 150 V. However, even this range is inadequate for practical purposes and therefore measures must be taken further to extend the linear relationship. This is achieved by connecting a certain additional resistance r_c in the grid circuit, see Fig.27. This resistance

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reduces the grid voltage of the valve under working conditions and maintains a high negative voltage on the blocked triode so that the working trajectory is a broken line with small slope and positive values of u_c and high slope at negative values. As the reduction in anode and grid current improves the operating conditions of the tube, it is possible considerably to increase the value of $E_a \text{ max}$. However, as in the negative grid voltage region the slope of the working trajectory is greater the non-operative triode is fully blocked at low values of input voltage E_a and the non-linear portion of the relationship between frequency and input voltage does not rise very much. Tests were made with an additional resistance r_c of 500 ohms and it was found that linearity was maintained in the range of 8 to 300 volts. Still better results were obtained by connecting five triodes in parallel with a resistance $r_c = 220$ ohms, when the range of linearity was 2 to 300 V. However, these measures do not overcome the great increase in frequency at very low input voltages. The use of an additional source of supply to overcome this has been mentioned above, the circuit was checked experimentally and it was found possible to maintain linearity practically from 0 to 300 V and only near the

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origin of coordinates was there some error which did not, however, exceed 1%. It is concluded that this type of convertor has been proved practical. It has the advantage of being supplied from a controlled source so that variation in the voltage on the outputs of the supply units has no influence on the convertor. Moreover, the input impedance is fairly high. The convertor frequency is not much affected by the resistances in the anode and grid circuits or by the tube characteristics. The frequency-impulse convertor may be designed for operation at low frequencies or at frequencies of some tens of kilocycles. A number of applications are mentioned, including: conversion of continuous electrical magnitudes into discrete double code; discrete integration of continuous magnitudes with output information in digital form; discrete differentiation of continuous magnitudes with output of differential in digital form. Semiconductor triodes may be used as well as tubes but these have a number of special features and further study is required. It is concluded that the inductive multi-vibrator is very flexible and may be used for various purposes, it is expected to find extensive use in the near future.

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There are 32 figures and 11 references: 6 Soviet and 5 non-Soviet.

ASSOCIATION: Taganrogskiy radiotekhnicheskiy institut
(Taganrog Radioengineering Institute)

SUBMITTED: August 16, 1960

Card 16/22

KALYAYEV, Anatoliy Basil'yevich, kand.tekhn.nauk, dotsent

Frequency-pulse converter of continuous electrical magnitudes.
Izv. vys. ucheb. zav.; elektromekh. 4 no.3:17-48 '61.

(MIRA 14:7)

1. Zamestitel' direktor a po nauchnoy rabote Taganrogskogo
radiotekhnicheskogo instituta.

(Electric current converters)

(Pulse techniques(Electronics))

KALYAYEV, A.V.

Frequency-pulse converter of continuous electric quantities into
a discrete code. Geofiz. prib. no.10:74-86 '61. (MIRA 15:8)
(Programming (Electronic computers))

L 18214-63

EWT(d)/FCC(w)/BDS ASD/ESD-3/APGC/IJP(C) Pg-4/Pk-4/Po-4/

Pg-4 GG

ACCESSION NR: AT3001877

S/2906/62/000/000/0080/0091

AUTHOR: Kalyayev, A. V. 174

TITLE: Ways of increasing the speed and expanding the logic capabilities of digital differential analyzers (DDA) 16C

SOURCE: Kombinirovannyye vychislitel'nyye mashiny; trudy II vsesoyuznoy konferentsii-seminara po teorii i metodam matematicheskogo modelirovaniya, Moscow, Izd-vo AN SSSR, 1962, 80-91.

TOPIC TAGS: computer, analyzer, differential, digital, logic, speed, memory, commutation, electronic, parallel, series, integrator

ABSTRACT: The author asserts that digital differential analyzers (DDA) have hitherto served well in the laboratory, but that only now the use of DDA's as control-equipment elements in automatic control and regulation is coming into its own. (An editorial footnote disagrees with this position and points to the use of DDA's in U.S. automatic navigation equipment since 1950. The author endeavors to show that DDA's, contrary to past criticism, have in fact fairly broad logic possibilities without excessive complication of the circuitry. Plug-type jumper-wire commutation is not suitable for control equipment; hence, high-speed

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electronic commutation between integrators is indispensable. Other requirements for DDA's as a control equipment, namely, small size, simplicity, and dependability, practicability with both discrete and continuous signals received from the controlled object, and the feasibility of issuing continuous and discrete control signals are all attainable in current practice. The paper deals with the three most important problems: (1) Increase in the operating rate of DDA's; (2) realization of electronic commutation; (3) attainment of the logic potentialities of the DDA. Block diagrams of parallel-series and parallel-parallel DDA's are shown and analyzed. A comparison of the number of iterations per second, as well as the frequency range, shows that the parallel-parallel-type DDA is the fastest-operating. However, from the point of view of the equipment employed, the most advantageous appear to be the series-series and series-parallel types, whereas from the point of view of speed under real-time conditions, adequately satisfactory results can be obtained both with the series-parallel and with the parallel-series types. It is concluded that the series-parallel type is preferable over-all, since it comprises less equipment and yet provides a speed comparable with that of the parallel-series type. The problem encountered with this type, however, is that all information in the integrators must enter, be analyzed, and be transmitted in parallel form. Practical devices are proposed therefor, and it is submitted that the construction of a series-parallel DDA appears fully realizable. The expansion of

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the logic capabilities of the DDA requires the development of fast-acting electronic commutation and the feasibility of altering the program in the course of the operation on the basis of logical analysis of the external and internal information. This requires an overflow register and a commutation-program memory block. Changes of program require a logic block which is most conveniently placed into the program-rerecording circuit. It is concluded that, in essence, the problem of the expansion of logic capabilities of a DDA is reduced to the problem of the study of certain matrix operators and methods for the correction of said operators in relation to certain logic conditions. The problem of this matrix-program correction has not as yet found a solution going beyond a rudimentary state. Further development of this problem promises extremely interesting results in the design of compact and flexible high-speed control machines based on DDA. Orig. art. has 7 figs. and 20 numbered equations.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 11Apr63

ENCL: 00

SUB CODE: GP, MM

NO REF SOV: 000

OTHER: 000

Card 3/3

KALYAYEV, Anatoliy Vagil'yevich, kand.tekhn.nauk, dotsent, starshiy nauchnyy
sotrudnik; OBROSOV, Ivan Ivanovich, kand.tekhn.nauk, dotsent;
BESEDIN, Viktor Ivanovich, inzh. starshiy prepodavatel'

Printing device for the output of a digital differential analyzer.
Izv. vys. ucheb. zav.; elektromekh. 6 no.1:85-54 '63. (MIRA 16:5)

1. Taganrogskiy radiotekhnicheskii institut.
(Electronic differential analyzers)

S/144/63/000/001/002/004
D230/D308

AUTHORS: Kalyayev, A.V., Candidate of Technical Sciences,
Docent, Obrosov, I.I., Candidate of Technical Sciences
Docent and Besedin, V.I., Engineer, Senior Lecturer

TITLE: Output printing device for a digital differential
analyzer

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Elektromekh-
nika, no. 1, 1963, 35-38

TEXT: The output printer described is used in conjunction
with an ordinary summing 10-key machine of the type CAM-107 (SDM-
107). In the operation, the number is set by means of digital keys.
The device is capable of printing the decimal number on a paper tape
70 mm wide. Addition or subtraction is performed by pressing the
appropriate "+" or "-" starting keys and the action is electromagnet-
ic. The estimated printing speed is 0.4 sec, without taking into
account the number starting time. The instrument is designed to have.

five-figure accuracy of the printed results of calculation; the num-
Card 1/2

Output printing device ...

S/144/63/000/001/002/004
D230/D308

bers are keyed successively, starting with the higher order. Each figure is fed to a decoder in a binary-decade code, the negative figures being introduced as an addition. In the case of a positive re-

device described. There are 2 figures.

ASSOCIATION: Taganrogskiy radiotekhnicheskiy institut (Taganrog
Radiotechnical Institute)

SUBMITTED: October 17, 1962

Card 2/2

ACCESSION NR: AR4035560

S/0271/64/000/003/B003/B003

SOURCE: Ref. zh. Avtomat., telemekh. i vy*chisl. tekhn. Av. T., Abs. 3B10

AUTHOR: Kalyayev, A. V.

TITLE: Digital integrators

CITED SOURCE: Tr. Seminara po metodam matem. modelir. i teorii elektr. tsepey. In-t kibernetiki AN USSR, vy*p. 1, 1963 , 172-190

TOPIC TAGS: integrator, digital integrator, synthesizing integrators

TRANSLATION: Numerical integration formulas suitable for synthesizing digital integrators are considered. Among them are: the rectangle and trapezoid formulas and Simpson's formulas. Conversion formulas with a limited number of digits are presented. Fundamental equations for integrators which take into account the transfer of variables from one integrator to another in the form of increments are developed. Block diagrams of digital integrators based on the fundamental equations for each method of integration are considered; it is proven that the scheme realizing the Simpson (parabola) formula has essential advantages in its simplicity and accuracy over the schemes based on the rectangle and trapezoid formulas. Ten

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ACCESSION NR: AR4035560

illustrations.

DATE ACQ: 17Apr64

SUB CODE: DP

ENCL: 00

Card 2/2

"APPROVED FOR RELEASE: 08/10/2001

CIA-RDP86-00513R000620220003-6

Card 2/2

APPROVED FOR RELEASE: 08/10/2001

CIA-RDP86-00513R000620220003-6"

KALYAYEV, A.V. (Taganrog); DVORYANTSEV, Yu.A. (Taganrog); MELIKHOV, A.N.
(Taganrog)

Use of graph theory methods in the synthesis of potential networks.
Izv. AN SSSR. Tekh. kib. no.4:65-69 J1-Ag '65. (MIRA 18:11)

KALYAYEV, Anatoliy Vasil'yevich, kand. tekhn. nauk, docent; REYSH, Leonid Sergeyevich, kand. tekhn. nauk

Review of G.E. Pukhov's book "Selected problems of the theory of computers." Izv. vys. ucheb. zav.; elektromekh. 8 no.1: 119-120 '65. (MIRA 18:3)

1. Zaveduyushchiy kafedroy vychislitel'noy tekhniki Taganrogskego radiotekhnicheskogo instituta (for Kalyayev). 2. Ispolnyayushchiy obyazannosti zaveduyushchego kafedroy teoreticheskikh osnov i teoreticheskoy elektrotekhniki Taganrogskego radiotekhnicheskogo instituta.

30200-10 EST(c) IUP(c)

ACC NR: AP6017925

SOURCE CODE: UR/0378/66/000/002/0013/0017

AUTHOR: Kalyayev, A. V.; P'yavchenko, O. N.

ORG: none

TITLE: Some problems in the solution of differential equation systems using extrapolation digital integrating machines in the initial segment

SOURCE: Kibernetika, no. 2, 1966, 13-17

TOPIC TAGS: information theory, digital integrator, digital differential analyzer, differential equation system

ABSTRACT: The article discusses the solution of the well-known Shannon equations

$$\left. \begin{aligned} dy_k &= \sum_{p=0}^n \sum_{j=0}^n a_{p/k} y_p dy_j; \\ k &= 2, 3, \dots, n; \\ y_0 &= 1; y_1 = x \end{aligned} \right\} \quad (1)$$

on digital integrating machines. The relative merits of the use for this purpose of

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UDC: 518.5:681.142

L 39200-56

ACC NR: AP6017925

interpolation and extrapolation difference formulas are discussed. It is shown that a considerable reduction of machine complexity can be achieved if interpolation formulas are employed in the design of the operational units of the computer, while on the whole the numerical solution of the equations is carried out by the extrapolation method. For this purpose, the authors have broken down the numerical integration process into two stages: a computation in the operational units of the proper increments by means of interpolation-type formulas, and subsequent extrapolation of the increments obtained one step ahead in order to compensate for the delay which results during the integration process. It is shown that the accuracy of the extrapolation of the increments is decisive to the accuracy of the solution. The method of consecutive approximations is used in the solution of the extrapolation difference equations during each integration step in the digital integrating machine. The fundamental operations for the organization of the computations are effected in the control device of the machine, giving rise to a certain inevitable increase in the complexity of the machine. However, the amount of additional equipment required will be negligible. Orig. art. has: 20 formulas.

SUB CODE: 09/ SUBM DATE: 20Sep65/ ORIG REF: 005/ OTH REF: 001

12/

Cord 2/2/77

ACC NR: AP0020695

SOURCE CODE: UR/0016/66/000/006/0147/0147

AUTHOR: Meshalova, A. N.; Kalyayev, A. V.; Drozdov, V. N.

ORG: Moscow Vaccine and Sera Institute (Moskovskiy institut vaktsin i syvorotok im. Mechnikova)

TITLE: Scrub typhus vaccine mechanism

SOURCE: Zh mikrobiol, epidemiol i immunobiol, no. 6, 1966, 147

TOPIC TAGS: microbiology, bacterial disease, disease control, clinical medicine, bacteria, epidemiology, scrub typhus vaccine, *VACCINE, IMMUNOLOGY*

ABSTRACT:

Reasons for the noneffectiveness of enteral scrub typhus vaccine have recently been discovered. When the vaccine reaches the digestive tract, digestive enzymes cause it to lose some its immunological properties. Experiments conducted by the authors showed that the antibody titer after seven days in rabbits immunized with heated vaccine was five times higher than in rabbits receiving two injections of vaccines preheated with stomach fluids. To protect the vaccine from digestive juices, it was enclosed in gelatin capsules coated with hydrolyzed fat plus stearine treated with formalin.

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UDC: 616.927-084.47:615.371]-032:611.3]-036.8

ACC NR: AP6020695

graphite and a stearine-pectin mixture. Pectin helps protect the vaccine
up to 18 hours.

[W.A. 50; CBE No. 10]

SUB CODE: 06/ SUBM DATE: 10Apr65/

Card 2/2

L 11176-67 EWT(d)/RWP(1) IJP(c) GG/BB

ACC NR: AP6024807

SOURCE CODE: UR/0378/66/000/003/0030/0045

AUTHOR: Kalyayev, A. V.

22

ORG: none

16C
TITLE: Numerical methods of Stieltjes integration in digital integration machines

SOURCE: Kibernetika, no. 3, 1966, 30-45

TOPIC TAGS: numeric integration, integration theory, digital integrator, control theory

ABSTRACT: At present, in an overwhelming majority of cases, digital integrating machines (DIM) are so designed that information is transmitted in the form of single-order increments from one solving unit to another, on employing as the integration formula either the rectangle or the trapezoid rule. In this case, DIM usually are termed digital differential analyzers (DDA). The single-order increments and low accuracy of the integration formulas restrict the accuracy and operating speed of DDA. The utilization of DIM in real-time control systems absolutely requires a marked increase in their accuracy and operating speed compared with single-order DDA. This may be accomplished by resorting to more exact integration formulas which require the simultaneous introduction of multiple-order increments during transmission

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UDC: 517.3:681.142.334

L 11176-67

ACC NR: AP6024807

of information from one solving unit to another. Adams formulas cannot be employed for this purpose, since they are suitable only for the integration of systems of differential equations presented in normal form, whereas DIM realize the Shannon system of differential equations. In this connection, it is shown that this Shannon system of equations can be numerically integrated with the aid of the Stieltjes integral. The pertinent interpolation and extrapolation formulas are derived and their errors estimated, and it is shown that extrapolation formulas may be converted to interpolation formulas by separating and performing separately the operations of the integration and extrapolation of increments. Such a method of integration facilitates the design and construction of the digital integrators incorporated in digital integrating machines. Orig. art. has: 10 tables, 54 formulas, 2 figures.

SUB CODE: 09,12 / SUBM DATE: 28Jun65/ ORIG REF: 001/ OTH REF: 001

Card 2/2 *in*

IL'INA, T.S.; KALIAYEVA, E.S.; KAMENEVA, S.V.

Effect of thy and tlr mutations on the thymine incorporation
in Escherichia coli K-12 cells. Genetika no.3:119-126 S '65.
(MIRA 18:12)

1. Institut atomnoy energii imeni I.V.Kurchatova, Moskva.
Submitted July 26, 1965.

VONSYATSKIY, V.A.; KALYAYEV, G.I.; BERLIN, A.A.

Kinetics of interaction between polyphenylene and 1,1-diphenyl-2-picrylhydrazyl. Izv.AN SSSR.Ser.khim. no.2:304-309 F '64.
(MIRA 17:3)

1. Institut khimicheskoy fiziki AN SSSR.

KALYAYEV, G. [Kaliaiev, H.], kand.geol.-miner.nauk

How to determine the age of banded clays. Znan.ta pratsia
no.6:11 Je '59. (MIRA 12:11)
(Clay)

15-1957-3-3702

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 3,
p 176 (USSR)

AUTHOR: Kalyayev, G. I.

TITLE: ~~Methods of Hydrogeological Appraisal of the Conditions~~
Methods of Hydrogeological Appraisal of the Conditions
for Constructing Reservoirs in the Steppe Regions of the
UkrSSR (O metodakh gidrogeologicheskoy otsenki usloviy
stroitel'stva prudov v stepnoy polose UkSSR)

PERIODICAL: Tr. Kiyevsk. gidromelior. in-ta, 1954, vol 4, pp 68-78

ABSTRACT: Bibliographical entry

Card 1/1

KALYAYEV, G.I. [Kaliaiev, H.I.]; ZARUBA, V.M.

Structure of the Sansagan overthrust. Geol. zhur. 17 no.4:40-46
'57. (MIRA 11:4)
(Krivoy Rog Basin--Geology, Structural)

KALYAYEV, G.I. [Kaliaiev, H.I.], kand.geol.-mineral.nauk

How can we determine the age of the earth. Nauka i zhyttia 8
no.4:33-36 Ap '58. (MIRA 13:5)
(Earth--Age)

KALYAYEV, G. [Kaliaiev, H.], kand.geol.-miner.nauk

Now it is the region of the Donets Basin. Znan.ta pratsia
no.12:25-26 D '59. (MIRA 13:4)
(Donets Basin--Coal geology)

BELEVTSSEV, Ya.N; KALYAYEV, G.I.; ZAGORUYKO, L.G.; SKURIDIN, S.A.; STRYGIN, A.I.;
FEDIYUSHIN, S.Ye.; FOMENKO, V.Iu.

Krivoy Rog-Kremenchug metallogenic zone. Geol.rud. mestorozh. no.6:
3-11 N-D '60. (MIRAL4:3)

1. AN USSR, Geologicheskiiy institut, Kiev.
(Ukraine—Ore deposits)

KALYAYEV, G.I. [Kajiaiev, H.I.]

Orekov-Pavlograd ore belt; metallogenic characteristics. Geol.
zhur. 21 no.6:36-43 '61. (MIRA 15:2)

1. Institut geologicheskikh nauk AN USSR.
(Ukraine--Ore deposits)